

What Is Claimed Is:

1. A system for copying data between a plurality of storage systems, comprising:

a first storage system coupled to a plurality of computers, which comprises a first logical volume storing data received from the plurality of computers; and

a second storage system coupled to said first storage system, which comprises a second logical volume storing copy data of data stored in said first logical volume;

wherein said first storage system assigns time information to write data received from the plurality of computers and sends the write data and time information to said second storage system; and

said second storage system stores write data received from said first storage system in said second logical volume in an order based on the time information assigned to this write data.

2. The system according to claim 1, wherein

said first storage system, when a write time is assigned to the write request or write data received from the computer, records the received write time and sends the write data with the received write time to said second storage system, and

when a write time has not been applied to the write request or write data received from the computer, assigns

the write time recorded by said first storage system to the received write data and sends the write data with the assigned write time to said second storage system.

3. The system according to claim 2, wherein

said first storage system comprises a plurality of first logical volumes,

said second storage system comprises a plurality of second logical volumes,

each of said plurality of second logical volumes belongs to one of a plurality of logical volume groups, and

said second storage system, in respect of each of said plurality of logical volume groups, records the latest write time in the write times assigned to the write data stored in a logical volume in the logical volume groups and stores write data, to which a write time indicting time prior to the latest write time has been assigned, in said second logical volume.

4. The system according to claim 3, wherein

said first storage system further assigns a sequential number to the write data for each of the logical volume groups and sends the write data with the assigned sequential number to said second storage system, and

said second storage system stores write data in a second logical volume in the order of the sequential numbers

assigned to the write data for each of the logical volume groups.

5. The system according to claim 4, wherein  
said second storage system stores write data in the sequential number order, so that there is no missing in the sequential numbers that are assigned to the write data stored in the second logical volume, for each logical volume group.

6. The system according to claim 1, wherein  
the time information that is assigned to the write data by said first storage system is a sequential number applied to the write data in the order of reception of the write data.

7. A system for copying data between a plurality of storage systems, comprising:

a first storage system coupled to a plurality of computers, which comprises a first logical volume storing data received from said plurality of computers;

a second storage system comprising a second logical volume, which stores copy data of data stored in said first logical volume; and

a third storage system comprising a third logical volume, which stores copy data of data stored in said first logical volume;

wherein said first storage system stores write data received from said plurality of computers in said first logical volume and sends the write data received from plurality of computers to said second storage system,

said second storage system assigns time information to the write data received from said first storage system and sends the write data with the time information to said third storage system; and

said third storage system stores write data received from said second storage system in said third logical volume in accordance with the time information assigned to the write data.

8. The system according to claim 7, wherein

the time information assigned to the write data is a sequential number assigned to the write data in the order of reception of the write data.

9. The system according to claim 7, wherein

said first storage system sends a completion report to the computer after receiving a report of reception of write data from said second storage system.

10. The system according to claim 7, wherein

said first storage system, when a write time is assigned to the write request or write data received from the computer, records the received write time and sends the

write data with the write time to said second storage system, and

when a write time is assigned to the write data received from said first storage system, said second storage system records the received write time and sends the write data with the write time to the third storage system,

when a write time has not been assigned to the write data received from said first storage system, said second storage system assigns the write time recorded in said second storage system to the received write data and sends the write data with the write time to said third storage system, and

said third storage system stores the received write data in said third logical volume in accordance with the write time assigned to the write data.

11. The system according to claim 10, wherein

said second storage system comprises a plurality of second logical volumes,

said third storage system comprises a plurality of third logical volumes,

said plurality of second logical volumes and said plurality of third of logical volumes respectively belong to one of a plurality of logical volume groups,

said third storage system, in respect of each of said plurality of logical volume groups, records the write time

that is closest to the current time in the write times assigned to the write data stored in a logical volume in the logical volume group, and

stores write data, to which a write time indicating time prior to the recorded write time has been assigned, in said third logical volume.

12. The system according to claim 11, wherein said second storage system further assigns a sequential number to the write data in respect of a logical volume belonging to a logical volume group for each of the logical volume groups and sends the write data with the sequential number to said third storage system, and

said third storage system stores write data in a third logical volume in the order of the sequential numbers assigned to the write data.

13. A system for copying data between a plurality of storage systems, comprising:

a first storage system coupled to a plurality of computers, which comprises a first logical volume storing write data received from the plurality of computers; and

a second storage system coupled to said first storage system, which comprises a second logical volume storing copy data of data stored in said first logical volume;

wherein said first storage system assigns a sequential number to write data received from the computer, sends the

write data with the sequential number to said second storage system, creates a marker including a sequential number, and sends the marker to said second storage system, and

said second storage system stores write data, to which a sequential number smaller than the sequential number included in the received marker is assigned, in said second logical volume in the order of the sequential numbers applied to the write data.

14. The system according to claim 13, wherein

said first storage system defers processing of write requests received from the computer based on an instruction from the computer, creates a marker to which a sequential number is included based on an instruction from the computer, sends the marker to said second storage system, and recommences processing of deferred write requests after sending the marker.

15. The system according to claim 13, wherein

said first storage system, while issuance of a write request to said first storage system from the computer is deferred, creates a marker including a sequential number and sends the marker to said second storage system.

16. The system according to claim 13, further comprising:

a plurality of first storage systems; and  
a plurality of second storage systems;

wherein each of the plurality of first storage systems creates a marker having a sequential number in accordance with an instructions from the computer and sends the created marker to one of said plurality of second storage systems, and

each of the plurality of second storage systems stores write data, to which a sequential number smaller than the sequential number included in the received marker is assigned, in the second logical volumes in the sequential number order.

17. The system according to claim 13,

wherein said plurality of first storage systems comprise a plurality of first logical volumes,

said plurality of second storage systems comprise a plurality of second logical volumes,

said plurality of first logical volumes and said plurality of second logical volumes respectively belong to one of a plurality of logical volume groups,

said first storage system assigns a sequential number to write data for each logical volume group, sends the write data with the sequential number to said second storage system, creates a marker having a sequential number for each logical volume group, and sends the marker to said second storage system, and



said second storage system stores write data, to which a sequential number smaller than the sequential number included in the received marker for the corresponding logical volume group is assigned, in a second logical volume.

18. A system for copying data between a plurality of storage systems, comprising:

a first storage system coupled to a plurality of computers, which comprises a first logical volume storing data received from the plurality of computers;

a second storage system coupled to said first storage system, which comprises a second logical volume storing copy data of data stored in said first logical volume; and

a third storage system coupled to said second storage system, which comprises a third logical volume storing copy data of data stored in said first logical volume

wherein

said first storage system stores write data received from the computer in said first logical volume and sends the write data to said second storage system,

said second storage system assigns a sequential number to the write data received from said first storage system, sends the write data with the sequential number to said third storage system, creates a marker including a sequential number, and sends this marker to said third storage system, and

said third storage system stores the write data, to which a sequential number smaller than the sequential number included in the received marker is assigned, in said third logical volume in the order of the sequential numbers assigned to the data.

19. The system according to claim 18, wherein said first storage system defers processing of write requests received from the computer based on an instruction received from the computer,

said first storage system transfers to said second storage system an instruction for creation of a marker received from the computer, and

said second storage system creates a marker based on the instruction for creation of a marker received from said first storage system.

20. The system according to claim 18, wherein

said second storage system creates a marker while issuance of write requests is deferred by a computer.